

How Computers Can Change the Writing Process

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The common wisdom of today is that children need to learn more mathematics and science so they can participate in a computer-based world. Accordingly, schools tend to relegate computers to mathematics and science classes and only reluctantly find uses for them in the subjects that directly address language use. This fits the belief that technical skills are essential for the use of computers and that computers are best for teaching technical subjects.

The irony is that in the world outside of school the real power of computers lies in the general manipulation of symbols, of which the numbers of technical calculations are but a special case. In fact, in the business and scientific worlds, computers are increasingly seen as valuable tools for word processing and non-numerical information processing. The use of computers to facilitate and expand communication networks between people is likely to prove even more significant. The result is that language skills are becoming more, rather than less, essential.

Recently, computers with word processing capabilities have been introduced into primary-grade language arts curricula. One example of writing software for children is the *QUILL* system (Collins, Bruce, and Rubin 1982; Rubin and Bruce in press). *QUILL* includes an information storage and retrieval system, an electronic mail system, and a program to help students plan and organize their thoughts. It also uses a text editor (Levin, Boruta, and Vasconcellows 1983). *QUILL* allows for peer-peer interaction in composing and revising, and encourages students to write to other students in the class. Although nominally a system for teaching writing, *QUILL* incorporates a considerable emphasis on reading by setting up classroom communication environments in which children's pieces are naturally read by their peers, and in which students communicate with one another for valid purposes.

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Proponents of word processing software for children have argued that the ease of revision and the ability to read printed output easily will be great aids in learning to write. Our research in *QUILL* classrooms has seen the value of these factors, but has also produced surprises. We are finding that changes in the pattern of social interactions in the classroom as a result of the computer may be even more significant than any simple technological effect. This has implications for teaching and for research on the use of computers in the classroom.

We will illustrate this point with an example of writing that occurred in a *QUILL* classroom. It is neither the best nor the worst piece of writing using *QUILL* that we have seen, and in fact, as shown here, it is a piece in progress. What is interesting is how it came to be and what that process tells us about computers in the classroom.

The Black History Show

The example is taken from a sixth grade classroom in a lower class urban school in the northeast U.S. One afternoon during Black History Week, Jim Aldridge's sixth grade attended the annual "Black History Show" put on by various classes in the school ranging from kindergarten to sixth grade. The show included a series of songs offered by different classes, one nonmusical skit, and several performances by the mixed-grade Glee Club—all commemorating famous black Americans or calling for racial harmony. Mr. Hodges, a teacher, was the emcee.

Jim had encouraged his sixth graders to write critical reviews of the show. With this in mind, many of them went to the performance equipped with pad and pencil, and were observed by the researchers to be taking notes periodically throughout the performance. The next day students who volunteered to critique the show were given suggestions by Jim regarding the kinds of evaluative information they should include (mentioning the quality of singing, scenery, lighting, best and worst acts). They were to write a draft of their review on paper at their desks, bring it to him for minor corrections, and then be assigned a number—first come, first served—to enter their writing onto the computer.

One of the results of this writing activity was Margaret's piece entitled "Black History Show." The following is an unedited copy of what Margaret wrote on the computer. The keywords at the bottom were selected by Margaret to identify her text (and can be used by other students to find this or other texts on a given topic stored in the computer).

"Black History Show"

Margaret

I liked the Black History show because I was surprised to see the little and big children singing so well, and clearly.

The best acts were Mrs. Martin's, and Miss Simpson's classes. The songs were nice and the people on stage weren't scared.

The worst act was "Famous Black People"—Mr. Agosto's + Mr. Anderson's class. Everybody messed up and forgot what to say, and they didn't speak clearly. They could have at least practiced more.

The scenery wasn't very much, and the light was kind of dull, and the sound wasn't very good. Mr. Hodges was speaking loud and clearly, and he was great on the stage. When the Glee-club was singing so nice, Marines got very jealous and asked Mrs. Evens to be in the Glee-Club. But when Mrs. Evens said no she wrote bad things about the Glee-Club on the computer up-stairs.

But I really liked the Black History show. I gave it 3 stars because it was very good.

Keywords:

/black history/Marines/glee-club/mrs. martin/miss simpson/

Briefly, Margaret's review shows several characteristics of good writing. She is sensitive to word choice. For example (a subsequent interview disclosed), she uses "and" in paragraph 2 to link two classes that gave separate performances, but "+" in paragraph 3 to indicate a single performance by two classes in concert. She refers to the "little and big children" in paragraph 1 in that unconventional order because she wants to highlight the surprisingly good performance of the younger children.

Moreover, the piece has an over-all structure—a beginning, middle, and end—marked by paragraphs, and internal patterning within paragraphs. Paragraphs 1 and 5 seem thematically and rhetorically parallel statements of positive evaluation and justification. Paragraphs 2 and 3 provide descriptive contrast sets, illustrating best and worst.

On the other hand, paragraph 4 stands out as somewhat incongruous in length, content, and linguistic form. It moves with little overt transition from descriptive illustrations like those of paragraphs 2 and 3 into a narrative about Marines, a story within the story (Bruce 1981). Linguistically, the shift into narrative is signalled by "When," the first temporal marker in the text; the clause it begins serves as orientation for the narrative. Margaret appears to assume that the reader will know her classmate Marines, as there is no identifying information other than her name. While the narrative account is personal, referring to someone the reader presumably knows well, the narrative voice is impersonal (third person omniscient point of view). The location of the narrator is signalled in the line "she wrote bad things about the Glee-Club on the computer up-stairs," which sets the account in the event itself, not in the writing context. This device serves to distance the author from Marines when, in fact, both girls did their writing on the same computer.

Corresponding to the shift to narrative syntax and narrative voice is a shift in topic as well—from "objective" criticism to personal anecdote—relating not to the quality of the show per se, but to what someone else wrote about it and why. The rhetorical force of paragraph 4 thus shifts from criticism of the show to implied criticism of a fellow critic who had opposing views. Margaret does not overtly discredit Marines as a critic, of course. She uses the narrative voice to distance herself, taking the stance of one who merely recounts "the facts"; it is up to the reader to infer her meaning. Significant to this inference is the pivotal yet ambiguous "But" that begins paragraph 5. Is the writer contrasting her own negative statements with her overall judgment of the show as positive, contrasting

her own views with those of Marines, or merely reiterating the position she stated in paragraph 1?

Further linguistic analysis could be done on Margaret's review. Yet without further information about the writer's goals, perceived audience, and process in composing the review, we cannot resolve the above problems of interpretation. Moreover, we are left with the question, why the stylistic and thematic incongruities in paragraphs 4 and 5? Is Margaret merely incompetent in using cohesive devices (Halliday and Hasan 1976) such as "but," and in maintaining a consistent voice and perspective throughout a written piece or does her writing reflect a young writer's attention to competing demands of style, audience, and purpose?

The Writing Context

Because we, as researchers, saw the show and observed classroom interactions around writing the reviews, we know more about Margaret's review than can be inferred from its finished form alone. This information is essential for a full appreciation of the writer's skill and complex goals. This section summarizes what we observed.

On the day after the "Black History Show," Margaret approached Jim with her handwritten draft, it contained only four paragraphs, the last of which read as follows:

The scenery was pretty good, and the light was bright enough, but the sound was not that good. Mr. Hodges was speaking very loudly and was good on the stage. I think the show deserves three stars because it was very good.

Jim gave Margaret the number 5, and Marines, her classmate and friend who finished soon after, the number 7. While milling around the computer waiting for their turns, Margaret read Marines's handwritten, highly negative review of the show (Marine's review was later published in the class newspaper). Marine's sharpest criticism was for the Glee Club. Some excerpts:

The scenery was very good it was excellent but the lighting was a little dull. The sound was awful in some acts but in others it was good.

I don't know what happened to the Glee Club, they were almost all weak. The audience couldn't hear them. They sounded soft then they went loud. It was a disaster!

When Margaret had her turn at the computer, she entered the first part of her text with minor changes (e.g., note the change from "the light was bright enough" to "the light was kind of dull," apparently influenced by Marines's text). However, she paused before entering the final line of her handwritten text, and composed the rest of paragraph 4 and the first sentence of paragraph 5 directly on the computer, revising the final sentence of the handwritten review to flow from what she had newly composed. This, in fact, demonstrates significant expertise in maintaining coherence in writing.

Rather than the Marines narrative (embedded in paragraph 4 of the final version) being an incongruous chunk therefore, we see the text as incorporating two separate planes. The first plane, composed in the original draft, is a straightforward critique of the show. The second, composed at the computer, is a more emotionally charged narrative, whose intent is to discredit Marines as a critic. This second plane stands outside the review proper and overlays it; it is a comment on the enterprise of criticism itself. As such, it is a metacommunicative act (Bateson 1972) responding to the power of and motives behind negative criticism. Margaret also uses this second plane to raise her own status as a critic—presenting her “competitor” as one with ulterior motives rather than honest judgment.

The pivotal “But” beginning paragraph 5 can now be seen as a contrastive device linking the two planes, indicating a distinction between Marines as critic (not to be trusted) and Margaret as critic (simply doing her job). When asked what she had intended in writing this sentence, Margaret said, “I meant, I really liked the show. It was good to *me*” (corroborating our interpretation).

Understanding the Writing (With Computer) Process

Several general points follow from this example. The first is methodological. To appreciate the subtlety and complexity of Margaret’s review, as well as to disentangle the meaning of paragraphs 4 and 5, we as researchers needed to have been there—during the performance and during the writing activities that followed. Moreover, we needed to understand something of the entire writing “system” within which Margaret wrote. This system led to: (1) initial (and relatively hasty) composition on paper, (2) time milling around the computer before being able to use it, (3) opportunities while milling around to read other students’ writing, and (4) time to enter text and also to compose afresh while at the computer.

A second point is closely related to the first: The most important impact of microcomputers on writing may be changes in the larger classroom writing “system” rather than changes in the technology of writing (e.g., speed, printed output, ease of revision). In “milling around” the computer waiting for their turn to get on, students read each other’s writing and interacted over it. These interactions affected both the content and form of student writing. Similarly, peer interactions during writing on the computer, student access to other students’ work stored in the computer, and programs like “Mailbag” in which students send messages to each other, can affect students’ understanding of purpose in writing, and their sense of audience. For Margaret’s review, it was these interactional factors—rather than the ease of typing at a keyboard and revising electronically—that influenced her final product most. A different classroom organization, incorporating one computer per student or constraints against reading fellow students’ work, would have produced a different outcome for Margaret’s review; her computer-assisted piece might have looked much like her far more ordinary hand-written draft.

A third point emerging from this analysis has to do with the writer's sense of audience. Margaret seemed to have assumed that the reader would be a member of the class—Jim Aldridge, most likely, but possibly also Marines or other students; in any case, someone with access to both her own and Marines's critiques. She seemed to assume that both written pieces would be equally in the public domain of the classroom. She therefore added to her information-oriented, "objective" criticism a second plane that was primarily a social metamessage with indirect discrediting force, telling the reader how her piece and Marines's piece should be understood. In doing so, she assumed that her reader would have the ability to infer her social meaning. For Margaret, both writing and reading are seen as social action—as communication between social actors.

Conclusion

How students like Margaret develop a sophisticated sense of audience, and the role that the computer plays in this process, needs to be investigated further. In Jim Aldridge's class, students' computer-assisted writing is striking in its attention to audience. We have seen a marked "media orientation"—the use of "Press Release" announcements; written commercials for up-coming stories; markers of episodes, chapters, and series; urgings to "stay tuned;" flashy titles (note the use of quotation marks in Margaret's title as a highlighting device); the use of pseudonyms (pen names), and deliberate use of nonconventional capitalization and punctuation for effect. We remarked earlier on how Margaret tuned her information for an insider who would have access to Marines's writing as well.

Several factors are probably involved here. Students' writing is public and available to be read as it is entered into the computer (looking over the writer's shoulder as it appears on the screen). Later, using the information storage and retrieval system, students can retrieve their own or someone else's writing stored on the computer. Writing comes off the printer typed and formatted, like published print (newspapers, magazine ads). It can then be seen on the wall (where its neatly typed format makes it easier to read and hence more accessible to classmates and outside visitors). Finally, through "Mailbag" (the electronic mail system), students write personal messages to one another (which are also public when being entered on the computer). The relative importance of these factors needs to be examined, because there are *QUILL* classrooms in which students have not demonstrated this heightened sense of audience and do not mark their written products with the media devices common to Jim Aldridge's class. These differences suggest the importance of looking at how writing "systems" vary across classrooms where computers are used.

This study reminds us that programs such as *QUILL* are far more open-ended than much of the "drill and practice" software currently available for educational use. These more open-ended programs not only allow, but require, active involvement and collaboration of students and teachers for their success. They can bring

substantial support from peers and adults. Unfortunately, teachers have been given little help in making the necessary choices about how a classroom computer can best be used.

To this end, it is important to understand the value of having researchers and teachers work collaboratively (see Florio and Walsh 1976). A computer can be a wonderful teaching tool, a major classroom disruption, or a waste of resources. Ideas for improvement in the use of computers are most likely to come from actively involved, informed teachers. Our research has been greatly facilitated by Jim Aldridge and other teachers who have become involved with us in the process of learning about classroom computers and the writing process.

References

- Bateson, G. "What Is Play?" In *Steps to an Ecology of Mind*. San Francisco, CA: Chandler, 1972.
- Bruce, B. C. "Stories within Stories." *Language Arts* 58 (1981): 931-936.
- Collins, A., Bruce, B. C., and Rubin, A. D. "Microcomputer-based Writing Activities for the Upper Elementary Grades." In *Proceedings of the Fourth International Congress and Exposition of the Society for Applied Learning and Technology*, Orlando, Florida, February 1982.
- Florio, S., and Walsh, M. "The Teacher as Colleague in Classroom Research." Paper presented at the American Educational Research Association Meeting. San Francisco, April 1976.
- Halliday, M.A.K., and Hasan, R. *Cohesion in English*. London: Langman, 1976.
- Levin, J. A., Boruta, M. J., and Vasconcellos, M. T. "Microcomputer-based Environments for Writing: A Writer's Assistant." In A. C. Wilkinson (Ed.), *Classroom Computers and Cognitive Science*. New York: Academic Press, 1983.
- Rubin, A. D., and Bruce, B. C. "QUILL: Reading and Writing with a Microcomputer." In B. A. Hutson (Ed.). *Advances in Reading and Language Research*. Greenwich, Conn.: JAI Press, in press.

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